

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1, 2, and 4 – 10 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The original disclosure as filed does not contain support for a process consisting only of the step recited in Claim 1.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 2, and 4 – 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 11080037 to Ishii et al. in view of US 2,761,835 to Brown. Citations for Ishii et al. are from the English-language abstract provided by Derwent.

Regarding Claims 1, 2, and 4 - 9. Ishii et al. teach a process of modifying an inorganic laminar compound by bringing it into contact with an “organic guest molecule” in the presence of supercritical carbon dioxide ("Problem to Be Solved"). The compounds and carbon dioxide are kept under a pressure of in the range of 10 – 20 MPa (100 – 200 bars) and a temperature in the range of 30 - 50°C. The inorganic guest molecule is uniformly absorbed in the voids of the laminar compound (Solution"), i.e. it is intercalated into the inorganic laminar compound. The inorganic laminar compound is preferably montmorillonite (Solution").

Ishii et al. does not expressly teach the organic guest molecule/intercalating agent to be one of the claimed compounds. However, Brown also teaches a method of intercalating/modifying montmorillonite with substituted ammonium ions from a salt such as tetraethylammonium chloride (Column 2, Lines 33 –38; Column 3, Lines 58 – 61; Column 4, Lines 20 – 21, 35 – 36, and 52 - 53). Ishii et al. and Brown are analogous art as they are from the same field of endeavor, namely processes for modifying montmorillonite and other similar compounds. At the time of invention, it would have been obvious to a person of ordinary skill in the art to use tetraethylammonium chloride as the organomodifier in the process taught by Ishii et al. The motivation would have been that tetraethylammonium chloride provides advantages such as improved mechanical strength and increased resistance to chemical attack to the clays it modifies (Brown, Column 3, Lines 58 – 62).

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over JP 11080037 to Ishii et al. in view of US 2,761,835 to Brown, as applied to Claim 1 above, and further in view of US 5,654,347 to Khemani et al.

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Regarding Claim 10. Ishii et al. teach the process of Claim 1 but do not expressly teach the modified clay produced is incorporated into a polyester foam with a regular, fine, and closed cell structure. However, Khemani et al. teach a polyester foam whose properties may be modified with the addition of clay (Column 4, Lines 30 – 33). Polyesters contain potentially hydrolysable ester bonds that give them biodegradability. The final polyester foam product has a well formed cell structure where all cells are closed cells with a diameter between 200 – 400 μm (Column 7, Line 60 – Column 8, Line 3). Ishii et al. and Khemani et al. are analogous art as they are from the same field of endeavor, namely compositions containing clay. At the time of invention, it would have been obvious to a person of ordinary skill in the art to incorporate the modified clay taught by Ishii et al. into a polyester foam with the cell structure taught by Khemani et al. The motivation would have been that the incorporation of clay into foam would enhance the properties, such as thermal stability and mechanical strength, in the final foam product and that modified clay has enhanced miscibility with polymers compared to unmodified clays.

Response to Arguments

Applicant's arguments with respect to Claims 1, 2, and 4 – 10 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Correspondence

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Liam J. Heincer whose telephone number is 571-270-3297. The examiner can normally be reached on Monday thru Friday 7:30 to 5:00 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Eashoo can be reached on 571-272-1197. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/Mark Eashoo/
Supervisory Patent Examiner, Art Unit 1796

LJH
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